

"QUIZ" for Lecture 3

E-MAILSCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: q3FirstLast.pdf) ASAP BUT NO LATER THAN Sept. 15, 8:00pm

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1. Find an equation of the plane that passes through the points  $(0, 1, 1)$ ,  $(1, 0, 1)$ ,  $(1, 1, 0)$ .

$$U = PQ = \langle 1, -1, 0 \rangle \quad V = PR = \langle 1, 0, -1 \rangle$$

$$U \times V = \begin{bmatrix} \hat{i} & \hat{j} & \hat{k} \\ 1 & -1 & 0 \\ 1 & 0 & -1 \end{bmatrix} \quad \hat{i}(1-0) - \hat{j}(-1-0) + \hat{k}(0+1)$$

$$\hat{i}(1) - \hat{j}(-1) + \hat{k}(1) = [1, -1, 1]$$

$(1, 1, 2)$  Fav Point

$$(x-1) \cdot 1 + (y-1) \cdot (-1) + (z-2) \cdot 1$$

$$x-1 + (-y) + 1 + z - 2$$

$$x - y + z - 2$$

$$\boxed{x - y + z = 2}$$

2. Find the intersection of the line

$$r(t) = \langle 1, 1, 0 \rangle + t\langle 0, 2, 4 \rangle$$

and the plane

$$x + y + z = 14$$

$$r(t) = \langle 1, 1, 0 \rangle + \langle 0, 2t, 4t \rangle$$

$$r(t) = \langle 1, 1+2t, 4t \rangle \quad x + y + z = 14$$

$$x = 1$$

$$y = 1 + 2t \quad z = 4t$$

$$y = 1 + z\left(\frac{z}{4}\right)$$

$$y = 1 + \frac{2z}{4}$$

$$1 + 1 + \frac{2z}{4} + z = 14$$

$$2z$$

$$2 + \frac{3z}{2} = 14$$

$$4 + 3z = 28$$

$$z = \frac{24}{3}$$

$$x = 1$$

$$y = \frac{14-1}{\frac{-24}{3}} \quad z = \frac{24}{3}$$